



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029

Ms. Colleen Davis  
United States Steel Corporation  
Clairton, Pennsylvania Coke Plant  
400 State Street  
Clairton, Pennsylvania 15025

NOV 20 2009

Dear Ms. Davis:

Enclosed is the Air Compliance Inspection Report for EPA's October 27 and 28, 2009 inspection of your Clairton, Pennsylvania facility. Thank you for your help and cooperation during this plant inspection. Also enclosed is information about EPA's Energy Star program that focuses on helping businesses help the environment and a CD with the photographs taken during the inspection. If you have any questions or comments in regard to this report, call James W. Hagedorn, of the Air Protection Division, at (215) 814-2161.

Sincerely,

A handwritten signature in cursive script that reads "Christopher B. Pilla".

Chris Pilla, Associate Director  
Office of Air Enforcement and  
Compliance Assistance

Enclosures

cc: Bill Clark, ACHD



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**DATE :** November 4, 2009

**SUBJ:** Inspection Report of US Steel, Clairton Works, Clairton, PA

**FROM:** James Hagedorn, Environmental Scientist, Air Enforcement  
and Compliance Assistance Branch

Jerome Curtin, Environmental Engineer, Air Enforcement and  
Compliance Assistance Branch

**VIA:** Chris Pilla, Associate Director, Office of Air Enforcement and  
Compliance Assistance and File Room

Address

U.S. Steel Clairton Works  
400 State Street  
Clairton, Pennsylvania 15025

Enforcement Personnel

Jim Hagedorn, Environmental Scientist, EPA, (215) 814-2161  
Jerry Curtin, Environmental Engineer, EPA, (215) 814-3171  
Dick Eaton, Environmental Scientist, EPA, (304) 234-0265

Personnel from U.S. Steel:

Colleen Davis, Environmental Contact, (412) 233-1015  
Mike Dzurinko, Environmental Dept., (412) 433-5904  
Mark Jeffrey, Headquarters, (412) 433-5915  
Dave Hacker, Law Dept., (412) 433-2919  
Mike Hohman, Environmental Dept., (412) 233-1467

Personnel from Allegheny County Health Dept.

Bill Clark, Coke Plant Specialist, (412) 578-8136

Angela Crowley, Inspector, (412) 583-3419

Date of Inspection: 10/27-28/09. EPA arrived on site at about 9:00 am.

## **Overview**

EPA conducted a compliance air inspection of the United States Steel Corporation cokemaking facility in Clairton, PA. The facility manufactures metallurgical coke to order for charging into blast furnaces in the production of iron which, ultimately, is converted to carbon steel. This was an announced inspection as EPA communicated via emails with Colleen Davis of the Company to let her know of the inspection and to request that information be made available during the inspection. As part of the physical in-plant inspection conducted on October 27 and 28, 2009, EPA examined the operations in the facility and did a walk around of the entire facility, currently in operation, which is located in Allegheny county. EPA also did some surveillance of the plant on Monday, October 26 for a short period of time and took photographs of plant structures and combustion stacks. Clairton Works has twelve coke batteries but only six of them are currently in operation. EPA investigated all six of the operating coke batteries during this two-day period. The first battery of ovens installed at Clairton Works went into construction in 1918. There currently are approximately 1200 employees working at USS Clairton Works on a three shift per day basis. This plant operates 24 hours per day and seven days per week.

## **Narrative**

Jim Hagedorn (the lead EPA investigator) and Jerry Curtin arrived on-site at 9:00 am. Also invited was a representative from the Allegheny County Health Department (ACHD). Richard Eaton of the EPA Wheeling Field Office also participated in this inspection due to the size and number of emission points in the cokemaking process. The EPA representatives identified ourselves to the United States Steel (USS) personnel and presented our EPA credentials/identification. EPA told the USS personnel that EPA was on-site to perform a comprehensive investigation of the USS facility for compliance with the Clean Air Act. EPA explained that we were looking at their compliance with all air regulations (NSPS, PSD, NSR,

MACT, NESHAPs, their permit, etc). EPA had emailed a letter to USS informing them of our inspection, requesting that they have some documents available dealing with the emissions at the USS Clairton facility.

EPA explained that EPA Region III oversees the air programs in 5 states (Pennsylvania, Maryland, Virginia, Delaware, and West Virginia) as well as the District of Columbia.

EPA explained some rules as we indicated we wanted to discuss the Facility operations initially and then to physically examine the facilities and other air emission points. EPA further indicated that the Agency inspectors wanted to take some photographs of the Facility and that we would supply USS with a copy of the photos for their review. If they thought any of the photos were Confidential Business Information (CBI), we would mark them as such and treat them as such. We also indicated that we would be writing an inspection report upon return to EPA so that if any discussion was to be considered CBI, to please let us know so the report might reflect that. We noted that EPA would send a copy of the inspection report to USS within about 6 weeks.

One item of investigation was the air toxics impact on local schools in the area and USS provided documents to us on air monitoring data for metals and heavy metals from the surrounding air samplers in the immediate, affected areas. We also talked about compliance with Maximum Available Control Technology regulations applicable to the Clairton facility and how the Company tracks their compliance with the requirements. USS also provided the various plans required for development and implementation by the applicable MACT regulations (Startup, Shutdown, Malfunction Plans, Operation and Maintenance Plans, etc.)

The following information was provided in the initial meeting with the Company on October 27, 2009 and during the inspection period:

1. Due to the economy, the Clairton plant is only operating six (6) coke batteries at the present time, namely, #1-#3 batteries, #19 and #20 batteries, and their large six meter battery, "B" battery. A coke battery is nothing more than a collection of coke ovens that are connected one beside the other. The current coking times for the batteries are: 21 hour coke for #19 and #20 batteries; 18 hour coke for the large "B" battery; and 20.5 hour coke for #1-#3 batteries. The

aspiration steam pressure used for emission control during the staged charging of coal into the ovens was 65 pounds per square inch (psi) for #1-#3 batteries; 53 psi for the large "B" battery; 63 psi for #19 battery; and 66 psi for the #20 battery.

2. This plant is covered by a National Pollutant Discharge Elimination System (NPDES) permit for water discharge to the Monongahela river. There are seven (7) water outfalls from the plant to the Monongahela river and one (1) intake pipe to pull water from the Monongahela river. Heritage Corporation handles the hazardous waste generated in the Clairton plant.
3. Chromium emissions are generated by the plant's coke quenching operation but the emissions of this heavy metal are minimal based on their emission inventory. Coke oven emissions are listed separately as a hazardous air pollutant by EPA regulations and this plant does have coke oven emissions the level of which is controlled by installed air pollution control equipment and various workpractices instituted in the plant.
4. The Company has two Consent Order and Agreements with ACHD due to excess emissions from certain Company processes and these agreements require the Company to shut certain coke batteries down by a date certain and to install new coke batteries with a different design and emission control strategy by a date certain. All of the "B" battery ovens were to be rebuilt on a schedule.
5. There was an explosion in the plant on September 3, 2009, the cause of which is still being investigated, in their cryogenic units which reduce the amount of coke oven gas going to the desulfurization system. ACHD has regulations that limit the amount of sulfur that can be in the coke oven gas as this gas is the primary fuel being combusted in the plant boilers, coke ovens, and various other equipment. Until the cryogenic units are rebuilt, the plant is combusting excess sulfur in their fuel combustion units which is creating a white plume which exits the coke battery combustion stacks. This white plume is quite obvious looking at the plant from off of plant property. The Company does not want to restart the gas desulfurization equipment until the root cause of the explosion is understood. This plant generates approximately 200 million standard

cubic feet of coke oven gas per day but the cryogenic units cut this number down to 20 million standard cubic feet per day which actually gets treated by the desulfurization system. USS has a redundant system (2 systems) for gas desulfurization so the gas has the sulfur taken out of it even during periods of equipment maintenance. The normal sulfur standard is 40 grains H<sub>2</sub>S per 100 standard cubic feet of gas but the gas sulfur concentration at the present time is in the range of 230-240 grains H<sub>2</sub>S per 100 cubic feet of gas.

6. The steel industry is in a downturn at the present time due to the poor economy and this has affected the coking industry in a similar fashion. Coke batteries 7-9 are shutdown and also cold which means they will never operate again without a rebuild. These three batteries are to be replaced, eventually, by a new six meter battery to be called "C" battery. Likewise, Coke batteries 1-3, which are currently operating, will be replaced by a new six meter battery to be called "D" battery. By the current agreement between the Company and ACHD, 1-3 batteries are to be shutdown by 8-11-15 and 7-9 batteries are to be shutdown by 1-24-13.
7. All the operating coke battery combustion stacks have continuous opacity monitors installed and "B" battery has a NO<sub>x</sub> CEM installed as well. The opacity monitors evaluate the opacity of the exhaust plume every 10 seconds and calculate a six minute average opacity.
8. The USS personnel stated that they do not see large holes in the oven refractory at Clairton, unlike other plants, and are moving away from the wet slurry patching method as other repair alternatives have proven to be more successful. USS does do dry gunning patching, endflue repairs, and some ceramic welding for oven maintenance. USS has retained Fosbell, Inc. for much of this type of oven repair.
9. This plant is subject to the relatively new Pushing MACT requirements, one of which stipulates that every oven has to be inspected every 90 days and the inspections are done by the USS heating department. Veolia Company does the daily opacity and coke oven emission inspections. The Company has a computer system that keeps track of the oven inspections and USS compliance with the other MACT regulations. The system will automatically send out emails reminding the environmental staff when required action items

come due. The Pushing MACT requires USS to monitor 4 consecutive pushes per battery per day. All the inspection/monitoring data is accumulated by the inspectors via a handheld PDA. The Company will only extend the length of the coking cycle for pushing emission control if they can't fix the problem coke oven. The usual reason for coke pushing emission exceedences is oven flue problems.

10. Part of the Pushing MACT standards has to do with quench towers and EPA was told that the quench tower baffle washing system automatically turns on at 1:00 PM every day. If the ambient temperature is less than 30 degrees Fahrenheit, no baffle washing needs to be done. River water is used for the baffle washing requirement. USS has five (5) quench towers for cooling the oven coke prior to its release onto the coke wharfs. At the present time, only three (3) of these quench towers are in use. Numbers 13-15 batteries are currently shutdown due to the economic conditions. Numbers 1-3 batteries share a quench tower; 13-15 batteries share a quench tower; 19-20 batteries share a quench tower and "B" battery has its own quench tower.
11. The Clairton mill participates in the nitrogen oxides trading program as they operate a number of boilers for the production of steam which is used for building heat, process steam, and for the cogeneration of electric power. The Clairton mill generates about 70% of their own electric power needs. They get the rest of the electricity from Reliant Energy. USS does not sell any power to the grid. USS has two electricity generators in this plant, a 20 Megawatt generator and a 10 Megawatt generator. The Company does not combust fuel oil in this plant and has no gas turbines either. Any natural gas needs are filled by Equitable Gas Company. This plant is currently not covered by a Title V permit. The Company is working with ACHD and the Pennsylvania Department of Environmental Protection for the development and execution of a PM 2.5 State Implementation Plan as required by Section 110 of the Clean Air Act. This plant does employ some degreasers and parts cleaners in their maintenance activity and the degreasing solvent in use right now is Safety Kleen Gold Solvent which is listed as nonhazardous.

After participating in the initial conference room meeting, the EPA representatives put on required safety equipment and proceeded outside to inspect emissions from various plant sources within the facility. A breakdown of the inspections is as follows:

#1 battery-charging, topsides, doors, pushing surveys  
 #2 battery-charging, topsides, doors, pushing surveys  
 #3 battery-charging, topsides, doors, pushing surveys  
 "B" battery-charging, topsides, doors surveys  
 19 battery-charging, topsides, doors, pushing surveys  
 20 battery-charging, topsides, doors, pushing surveys

The results of the individual inspections are as follows:

**October 27, 2009**

Process	Inspector	Allowable	Actual
19 COB Doors	Jim Hagedorn	8% leaks	0% leaks
19 COB Pushing	Jim Hagedorn	<20% opacity	13 sec >=20% for A3 oven
19 COB Charging	Jim Hagedorn	75 sec/4chgs	8 sec/4chgs
19 COB Topside	Jim Hagedorn	5% leakage	2.4% leakage
20 COB Pushing	Jim Hagedorn	<20% opacity	0 sec >=20%
20 COB Topside	Jim Hagedorn	5% leakage	0% leakage
20 COB Doors	Jim Hagedorn	10% leaks	0% leaks
2 COB Charging	Dick Eaton	75 sec/4chgs	14 sec/4chgs
3 COB Charging	Dick Eaton	75 sec/4chgs	20 sec/4chgs
2 COB Topside	Dick Eaton	5% leakage	0% leakage
3 COB Topside	Dick Eaton	5% leakage	0.78% leaks
2 COB Doors	Jerry Curtin	10% leaks	1.2% leaks
3 COB Doors	Jerry Curtin	10% leaks	0% leaks
2 COB Pushing	Jerry Curtin	<20% opacity	<20% opacity
19 COB Pushing	Jerry Curtin	<20% opacity	<20% opacity

October 28, 2009

Process	Inspector	Allowable	Actual
20 COB Charging	Jim Hagedorn	55 sec/5chgs	8 sec/5chgs
1 COB Charging	Dick Eaton	75 sec/4chgs	14 sec/4chgs
"B" COB Charges	Dick Eaton	55 sec/5chgs	32 sec/5chgs
1 COB Topsides	Dick Eaton	5% leakage	0% leakage
"B" COB Topside	Dick Eaton	4% leakage	0% leakage
"B" COB Doors	Jerry Curtin	5% leakage	0% leakage
1 COB Pushing	Jerry Curtin	<20% opacity	<20% opacity
3 COB Pushing	Jerry Curtin	<20% opacity	<20% opacity

A review of the inspection data sheets did not result in any documented violations of the applicable emission standards for the inspected emission sources except for one coke pushing operation for the A-3 oven on #19 battery which resulted in 13 seconds of pushing emissions at an opacity greater than or equal to 20% opacity which is a violation of the Allegheny County portion of the Pennsylvania State Implementation Plan. The maximum opacity achieved during this one push was 60% opacity. Colleen Davis of USS was present during this push and told EPA that she would look into the cause of the noncompliance and report this to EPA.

At the conclusion of the inspection, EPA indicated that we may be contacting USS for more information regarding any remaining issues. During the inspection, USS made records available for EPA to review and provided copies of that information. Any written responses and documentation provided by USS will be filed in EPA's file room under United States Steel Corporation of Clairton, PA at the conclusion of EPA's investigation. The USS oral responses are noted in this report.

EPA did take photographs of the site. A photo log is included at the end of this inspection report. At the conclusion of the inspection, we thanked the plant personnel for their cooperation.

EPA left the facility at around 4:00 PM on both days.

Photo Log

Photos taken by Jerry Curtin

On October 26, 27 and 28, 2009

<u>Photo</u>	<u>Description</u>
	<u>Date and Time Taken</u>
1	Batteries 13,14, 15, 19, 20 and B from an elevated 10/26 at 1:45 pm position on the other side of the Monongahela River
2	10/26 between 1:46-1:51 pm Batteries 1, 2, 3, 7, 8, and 9 from an elevated position on the other side of the Monongahela River
3	Close up of emissions from Battery 1 with batteries 2, 7 and 8 10/26 at 1:15 pm nearby as photographed from an elevated position on the other side of the Monongahela River.
4	Close up of emissions from Battery 19 with batteries 13, 14, and 20 10/26 at 1:54 pm nearby as photographed from an elevated position on the other side of the Monongahela River
5	Close up of emissions from Battery 3 with battery 9 10/26 at 1:55 pm nearby as photographed from an elevated position on the other side of the Monongahela River
6	Close up of emissions Battery B with battery 15 nearby as 10/26 at 1:56 pm photographed from an elevated position on the other side of the Monongahela River
7	Emissions from Battery 2, Door A20, Pushing Side 10/27 at 1:37 pm
8	Closer view of emissions from Battery 2, Door A20, Pushing Side 10/27 at 1:37 pm
9	Emissions from Battery 2, Door B1, also showing Doors A31-B9 10/27 at 2:03 pm
10	A close up of Battery 2, Door B1 and adjacent doors 10/27 at 2:03 pm
11	Emissions from Battery 2, Door B7, also showing doors B3-B14 10/27 at 2:04 pm
12	Close up of Battery 2, Door B7, and adjacent doors B8-B10 10/27 at 2:05 pm
13	Pushing at Battery 2, door B9 10/27 at 2:05 pm
14	Shed, Battery B, Charging Side 10/28 at 11:12 am

- 15 Another view of the shed, Battery B, Charging side  
10/28 at 11:12 am
- 16 Emissions from Standpipe Battery 1, Door B30, Charging Side  
10/28 at 12:03 pm
- ~~17 Emissions from Standpipe Battery 1, Door B30, Charging Side  
10/28 at 12:03 pm~~
- 18 Emissions from Standpipe Battery 1, Door C1, Charging Side  
10/28 at 12:12 pm
- 19 Emissions from Standpipe Battery 1, Door C1, Charging Side  
10/28 at 12:12 pm
- 20 Emissions from Standpipe Battery 1, Door C1, Charging Side  
10/28 at 12:12 pm
- 21 Emissions from Standpipe Battery 3, Door A29, Charging Side  
10/28 at 3:23 pm
- 22 Emissions from Standpipe Battery 3, Door A29, Charging Side  
10/28 at 3:23 pm